

REMARKS

Claims 1-59, 62-86, and 88-104 are pending in this application. By the Office Action, claims 1-56 are withdrawn from consideration; claims 57-78, 80 and 82 are rejected under 35 U.S.C. §102(b); and claims 79, 81 and 83-104 are rejected under 35 U.S.C. §103(a). By this Amendment, claims 57, 63, and 84 are amended, and claims 60-61 and 87 are canceled. No new matter has been added.

I. Rejection Under §102

The Office Action rejects claims 57-78, 80 and 82 under 35 U.S.C. §102(b) over JP 2000-183523 to Takashi et al. ("Takashi"). Claim 57 is amended and claims 60-61 are canceled. Applicants respectfully traverse the rejection with respect to the amended claims.

Claim 57 is directed to a process for producing an electronic component, comprising the steps of: providing (A) a laminate of a conductive inorganic material later, an insulating layer, and a conductive inorganic material layer, or (B) a laminate of a conductive inorganic material later and an insulating layer; wet etching the conductive inorganic material layer in the laminate thereby patterning the conductive inorganic material layer; laminating a dry film resist onto said laminate in which the conductive inorganic material layer has been patterned; patterning the dry film resist, the dry film resist being developable with an aqueous solution and being able to be separated by the aqueous solution; treating the thus patterned dry film resist with ultraviolet light irradiation and/or heat thereby improving the resistance of the dry film resist to the etchant for the insulating layer; and wet etching the insulating layer through the patterned dry film resist by an aqueous basic solution. Takashi does not teach or suggest such a process.

The Office Action asserts that Takashi discloses a process for forming an electronic component comprising wet etching a laminate of a conductive inorganic material layer—insulating layer—conductive inorganic material layer or a conductive inorganic material layer—

insulating layer to pattern the conductive inorganic material layer, and wet etching to pattern the insulating layer of the laminate using a dry film resist. Notwithstanding these assertions, Takashi does not teach or suggest the process of claim 57.

Claim 57 requires that wet etching of an insulating layer be conducted through a patterned dry film resist using an aqueous basic solution. While Takashi discloses wet etching using a dry film resist, that process step is limited to the processing of a conductive substrate, not processing of an insulating layer beneath a conductive substrate. For example, Takashi discloses at paragraph [0013] that the copper foil 12 is etched with a dry film resist 13. The copper foil 12 of Takashi corresponds to a conductive substrate, not to an insulating layer, as claimed. There is no disclosure in Takashi that the insulating substrate 11 is also wet etched with a dry film resist. Takashi does not disclose a further step of wet etching an insulating layer through a dry film resist, using an aqueous basic solution.

Moreover, Takashi does not appreciate the unexpected, superior results discovered by the present inventors with respect to the practice of wet etching an insulating layer using a dry film resist. In particular, the present inventors have discovered that it is possible to improve the amount of time used and the quality of shapes obtained by wet etching by employing dry film resists. *See* instant specification, page 23, lines 12-25. Takashi thus does not teach or suggest the process step of wet etching an insulating layer through a patterned dry film resist using an aqueous basic solution, or the benefits that stem therefrom.

Accordingly, Takashi does not teach or suggest each and every feature of claim 57. Claim 57 is thus not anticipated by Takashi. Claims 58-59, 62-78, 80 and 82 depend from claim 57 and, thus, also are not anticipated by Takashi. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

II. Rejection Under §103

The Office Action rejects claims 79, 81 and 83-104 under 35 U.S.C. §103(a) over Takashi in view of U.S. Patent No. 6,596,184 to Shum et al. ("Shum"). Claim 84 is amended and claim 87 is canceled. Applicants respectfully traverse the rejection with respect to the amended claims.

Claim 57 is set forth above. Claim 84 is directed to a process for producing an electronic component, comprising the steps of: providing (A) a laminate of a laminate of a conductive inorganic material layer, an insulating layer, and a conductive inorganic material layer, or (B) a laminate of a conductive inorganic material layer and an insulating layer; wet etching the conductive inorganic material layer in the laminate, thereby patterning the conductive inorganic material layer; laminating a dry film resist onto said laminate in which the conductive inorganic material layer has been patterned; patterning the dry film resist, the dry film resist being developable with an aqueous solution and being able to be separated by the aqueous solution; treating the thus patterned dry film resist with ultraviolet light irradiation and/or heat thereby improving the resistance of the dry film resist to the etchant for the insulating layer; and wet etching the insulating layer through the patterned dry film resist by an aqueous basic solution, wherein a thickness of the dry film resist is not less than 1.1 times that of one conductive inorganic material layer in the laminate, and when the material to be etched is dipped in an etching liquid held at 70°C, a holding time of the dry film resist pattern is not less than one min. The processes of claims 57 and 84 are nowhere taught or suggested by Takashi and Shum.

The Office Action relies on Takashi for the reasons discussed above. The Office Action asserts that Shum further discloses various specific conditions under which an electronic component is produced. Notwithstanding these assertions, any combination of Takashi and Shum does not teach or suggest the processes of claims 57 and 84.

For the reasons discussed above, Takashi does not teach or suggest the process of claim 57. Takashi at least fails to teach or suggest wet etching an insulating layer through a dry film resist, using an aqueous basic solution, as claimed. Shum does not remedy the deficiencies of Takashi. Regardless of its actual teachings, Shum, like Takashi, does not teach or suggest a process including wet etching an insulating layer through a dry film resist using an aqueous basic solution. Nor does Shum teach or suggest any benefits that would be obtained thereby. One of ordinary skill in the art, based on the level of skill in the art and the disclosures of Takashi and Shum, would not have been motivated to modify the process of Takashi to practice the claimed invention. As neither Takashi nor Shum teaches or suggests a process including wet etching an insulating layer through a dry film resist using an aqueous basic solution, the combination of Takashi and Shum fails to teach or suggest the processes of claims 57 and 84.

Furthermore, with respect to claim 84, the Office Action concedes that Takashi does not disclose a process for producing an electronic component comprising performing wet etching a laminate, wherein a thickness of a dry resist film used in the etch is not less than 1.1 times that of one conductive inorganic material layer in the laminate. The Office Action further concedes that Takashi does not disclose a process in which, when a material to be etched is dipped in an etching liquid held at 70 °C, the holding time of the dry film resist pattern is not less than one minute. However, the Office Action asserts that it would have been obvious to optimize the resist film thicknesses, temperatures, etc. of the processes disclosed in Takashi. Applicants disagree.

It is evident from the instant specification, however, that the particular parameters recited in claim 84 provide unexpected and superior performance. These are not mere routine process parameters that would be subject to optimization based on the disclosure of Takashi. For example, as shown in Table D7 of the instant specification, using a dry film resist that is

thinner or has the same thickness as a conductive inorganic layer of a laminate to be etched, will cause the conductive inorganic layer to break through the dry resist film. *See* instant specification, pages 111 to 112. Moreover, the particular temperature and time limitations recited in claim 84 prevent separation of the dry film resist during etching. *See* instant specification, page 137, lines 1 to 9 Takashi does not recognize the benefits. These results show that different results are obtained when the parameters are changed -- not merely that the already provided results are optimized. Takashi nowhere teaches or suggests that such unexpected results can be obtained by particularly selecting the thickness of the dry resist film and the holding time of the dry film resist pattern in the etching liquid, as claimed.

Accordingly, Takashi does not teach or suggest the etching conditions of claim 84, and does not recognize the benefits achieved by selecting such conditions. Shum is similarly silent with respect to the conditions and benefits discussed above. Takashi and Shum, either alone or in combination, fail to teach or suggest each and every feature of claim 84.


Claims 57 and 84 would not have been rendered obvious by Takashi and Shum. Claims 79, 81, 83, 85-86 and 88-104 depend variously from claims 57 and 84 and, thus, also would not have been rendered obvious by the cited references. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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